Knowledge Management/Data Mining

Knowledge management generates value by leveraging relevant information from personnel and information systems and preserving corporate knowledge. Data mining adds information from unorganized data sources to the explicit store of enterprise knowledge.

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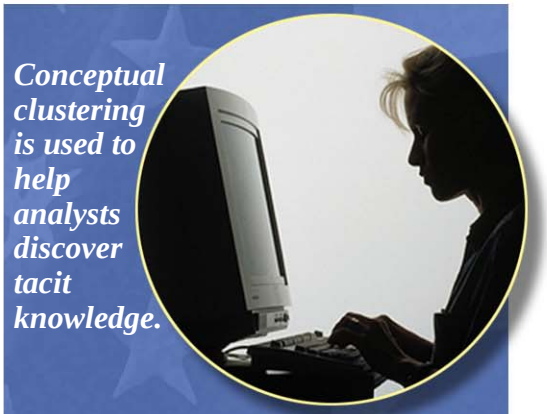
No modern business or government agency can thrive without knowledge. Amid mountains of data, relevant information must be identified, structured, and directed toward work processes to effectively facilitate or enable the achievement of goals and end-products. **Knowledge management** structures, maintains, and provides access to knowledge within information systems. **Data mining** extracts relevant tacit knowledge from information system assets through data correlation.

The Knowledge Management Applications group of the Technical Computing organization has extensive capabilities in many facets of knowledge management, including highly secure data warehousing, expert system information-of-value determination, advanced document and content indexing and access systems, and knowledge engineering. Data mining can be performed in highly automated fashion on single documents or archives of related documents, using both expert systems and conceptual clustering.

Capabilities

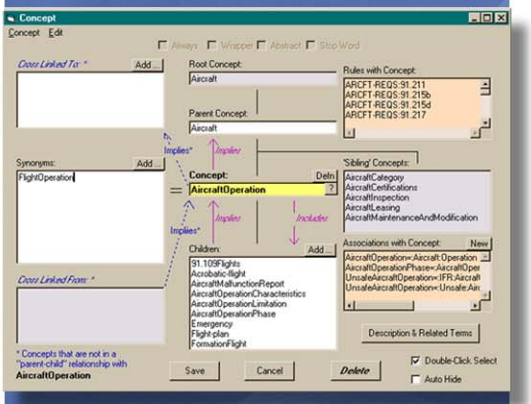
- Model-based document life-cycle management
- Automated workflow and configuration management
- Document imaging and on-line archival
- Metadata- and content-based access control
- Automated content classification and characterization
- Knowledge engineering, knowledge preservation, and specialized knowledge base development
- Enhanced content management and integration using semantic Web technologies, XML, and Web services
- Taxonomic conceptual clustering and natural language processing technologies
- Expert system development



Conceptual clustering is used to help analysts discover tacit knowledge.

The Ferret Expert System

Enables automated determination and/or typing of information excerpts in real time with high effectiveness and relevancy.



KEMA knowledge engineering tool enables non-computer programmers to build and maintain their own expert knowledge bases for use with Ferret and some commercial tools.

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Applications

The Knowledge Management Applications group provides document and content management support to the customers within the U.S. Department of Energy Nuclear Weapons Complex and the U.S. Department of Defense. The application of document management and data mining technologies provides essential services in business and engineering process support, is very cost-effective, and enables processes and analysis that would otherwise be unfeasible. Document management and data mining support have been provided in the following areas:

- Product engineering document and drawing repositories for highly classified environments
- Record imaging and archival products
- Sensitivity level and governing regulation determination systems
- Sensitive excerpt identification and redaction systems
- Subject and category determination systems
- Need-to-know policy enforcement subsystems
- Web crawler and storage system robot to identify and summarize pages or files with “important” content
- E-mail message sensitivity determination and delivery interdiction systems
- System to monitor a document archive for important new files with automated notification
- Data mining engine to perform conceptual clustering using analyst-weighted, numerical taxonomy-based similarity coefficients
- Expert inference engine to perform automated real-time determination of information of value, possibilities, and significant elaboration on unformatted text
- Knowledge base editing tools to support knowledge engineering by subject matter experts

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